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EXAMINER

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ART UNIT	PAPER NUMBER
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2685

DATE MAILED: 02/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Art Unit: 2685

Detailed Action

1. Applicant has canceled claims 1-72, and adding new claims 73-103, preliminary amendment 7/04/2004.

Priority

2. Applicant claims foreign priority benefit. However, the certified copy of the foreign priority is not received yet. A copy of the certified foreign priority is required. See MPEP 201.14 (b).

For this office action, the foreign priority is considered based on the priority date, 05/20/1999.

Specification -Abstract

3. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required. If applicant is relying upon the abstract from WO 01/03,233, please indicate the validity.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 73, 82, 89-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chapell (US 4,755,778) in view of Matsuoka (US 5,757,336).

Regarding **claim 73**, a variable phase shifter [Fig. 3-4, Fig. 7] comprising first and second coupled signal conductors [coupling movable second center conductor 96 to the first fixed conductor 97, via slider 92, Fig. 7-8, col. 6, line 43 to col. 7, line 28]

Art Unit: 2685

providing a transmission path [a U shape transmission path of 96 is provided:]
through the phase shifter [in Fig. 7-8]

the signal conductors [96-98] being relatively movable to vary the physical length
of the transmission path [the movable 96 via slider 92 to change the physical length
of transmission line, col. 6, lines 61-64],

wherein at least one of the signal conductors has a coupling surface which faces
the other signal conductor [the signal conductor 96 is facing the signal conductor 97
as shown in Fig. 7-8].

Chapell fails to teach the which is provided with an oxide coating.

Matsuoka teaches these features [the u shape cuts in casing 2, for mold springs
21 of case 2, to engaging protrusions 7 of case 3, is formed by using polyphenylene
oxide, col. 4, line 31-64], to prevent the wear, tear, of the material. Therefore, It
would have been obvious to one of ordinary skill in the art at the time of invention to
upgrade Chapell with Matsuoka' oxide coating, in order to prevent the wear, tear, of
the material.

Regarding **claim 82**, Chapell teaches the further comprising a third signal conductor
[98, Fig. 7-8],

wherein the second signal conductor 96 has a first arm coupled to the first signal
conductor 97 and a second arm coupled to the third signal conductor [coupling the
96 to 98 in Fig 7-8],

whereby the second signal conductor 96 provides a transmission path [U shape
transmission path in Fig. 7-8] between the first 97 and third 98 signal conductors,
and

wherein the second signal conductor 96 and the first 97 and third 98 signal
conductors are relatively movable to vary the physical length of the transmission path

Art Unit: 2685

[the movable to change the transmission length by slider 92, col. 6, line 53 to col. 7, line 12].

Regarding **claim 89, 90**, Chapell teaches the microwave phase shifter [col. 2, lines 1-6] for the microwave frequency range, which covered the frequency range to dimension the variable phase shifter in between, 400 MHz to 3GHz, & 800 MHz to 2.5 GHz.

5. Claims 74-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chapell in view of Matsuoka, as applied to claim 73 above, and further in view of Barkman et al. (US 3,616,311).

Regarding **claim 74**, Chapell & Matsuoka fails to teach the wherein the coating has been formed by a process of anodisation.

Barkman et al. (Barkman) teaches the anodisation process for providing a oxide coating [abstract, the harder anodized surface in col. 1, lines 56-62 & summary of invention], to resist surface abrasion & cracking [col. 1, lines 13-39]. Therefore, It would have been obvious to one of ordinary skill in the art at the time of invention to upgrade Chapell, Matsuoka with Barkman's oxide coating process, in order to resist surface abrasion & cracking.

Regarding **claim 75**, Barkman teaches the wherein the coating has been formed by a process of hard anodisation [col. 1, lines 50-67].

Regarding **claim 76**, Barkman teaches the signal conductor with the oxide coating is formed from Aluminum or a alloy thereof [abstract, col. 1, lines 43-55].

Art Unit: 2685

6. Claims 77-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chapell in view of Matsuoka, as applied to claim 73 above, and further in view of Caule (US 4,312,922).

Regarding **claim 77**, Chapell & Matsuoka fail to teach the feature for this claim.

Caule teaches the wherein at least one of the signal conductors has a lubricating coating formed on a surface thereof [the outer lubricant film is formed over oxidation layer, to reduce the work frictional force, abstract, col. 1, lines 41-59]. Therefore, It would have been obvious to one of ordinary skill in the art at the time of invention to upgrade Chapell, Matsuoka, with Caule's formed outer lubricant film, in order to reduce the work frictional force.

Regarding **claim 78**, Caule teaches the wherein the lubricating coating is formed on top of the oxide coating [the oxidation of the sheet surface, then, apply lubricant, col. 1, line 64 to col. 2, line 12].

Regarding **claim 79**, Caule teaches the wherein the lubricating coating is formed by spray-coating [col. 2, lines 3-12].

7. Claims 84-86, 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chapell in view of Matsuoka, as applied to claim 73 above, and further in view of Wheeler (US 2,502,359).

Regarding **claim 84**, Chapell & Matsuoka fail to teach the features for this claim.

Wheeler teaches the wherein the second signal conductor is separated from the first signal conductor by a dielectric whereby the first and second signal conductors are capacitively coupled [the liquid dielectric 28 in housing 19 and 10' for separating conductor 11', 12' & U-shaped section 13' in Fig. 4, for the capacitively coupling via the liquid dielectric material 28, col. 6, lines 59-75 & col. 5, line 56 to col. 7, line 2], to

Art Unit: 2685

maintaining the characteristic impedance & reduce the transmission line length via the dielectric constant greater than unit. Therefore, It would have been obvious to one of ordinary skill in the art at the time of invention to upgrade Chapell, Matsuoka with Wheeler's liquid dielectric material in between conductors, in order to maintaining the characteristic impedance & reduce the transmission line length via the dielectric constant greater than unit.

Regarding **claim 85**, wheeler teaches the wherein the dielectric comprises a solid of liquid dielectric material 28 [col. 6, lines 59 to col. 7, line 2].

Regarding **claim 86**, Matsuoka teaches the wherein the dielectric comprises a dielectric coating on the first and/or the second signal conductor [the liquid dielectric 28 coated the conductor 11', 12', 13', Fig. 4].

Regarding **claim 88**, Wheeler teaches the wherein the dielectric material is in contact with both signal conductors whereby the dielectric material provides a sliding bearing surface when the signal conductors are relatively moved. [the liquid dielectric material 28 provide a sliding bearing surface for the relatively moved signal conductors 11', 12', 13', Fig. 4, col. 6, lines 59 to col. 7, line 2].

8. Claim 87 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chapell in view of Matsuoka, Wheeler, as applied to claim 86 above, and further in view of Bennin et al. (US 6,134,075).

Regarding **claim 87**, Chapell & Matsuoka fail to teach the features for this claim.

Bennin et al. (Bennin) teaches the wherein the dielectric coating is formed by spray coating [the spray coating of the dielectric material to form coating layer 34 on conduct track 11, Fig. 1, Fig. 4A-4B, col. 11, lines 8-16], to prevent the corrosion.

Therefore, It would have been obvious to one of ordinary skill in the art at the time of

Art Unit: 2685

invention to upgrade Chapell, Matsuoka with Bennin's spray coating of the dielectric coating on track conductor, in order to prevent the corrosion.

9. Claim 92 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chapell in view of Matsuoka, Altes, as applied to claim 73 above, and further in view of Bingley (US 2,437,067).

Regarding **claim 92**, Chapell, Matsuoka, Altes fail to teach the features in this claim. Bingley teaches an impedance matcher [6, 7, Fig. 1-2, col. 2, line 55 to col. 3, line 12] coupled between two of the signal terminals [terminals for 8 and terminal for 3], in order to maintain the impedance through out the line length adjustment [col. 1, lines 46 to col. 2, line 2]. Therefore, It would have been obvious to one of ordinary skill in the art at the time of invention to upgrade chapell, Matsuoka, Altes with Bingley's impedance matcher 6, 7, in order to maintain the impedance through out the line length adjustment.

10. Claims 93-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chapell in view of Matsuoka, as applied to claim 73 above, and further in view of Hampel et al. (US 5,905,462).

Regarding **claim 93**, Chapell teaches the phase shifter in claim 73. Chapell & Matsuoka fail to teach the features for this claim.

Hampel et al. (Hampel) teaches a phase array antenna comprising at least two radiating elements [Fig. 6, phase array antenna 616 with at least two radiating elements 146-140 having phase shifters 630-634, col. 4, lines 38-42 & col. 10, lines 14-38], a feed network for feeding relatively phase shifted signals to the radiating elements, wherein the feed network comprised one of more variable phase shifters

Art Unit: 2685

[the feeding network for phase shifter 630-634 having movable dielectric slab, 650-670, for relatively providing the phase shift signal to each radiating elements 140-146, col. 10, line 63 to col. 11, 20], in order to vary the antenna radiation pattern formed by radiating elements 140-146. Therefore, It would have been obvious to one of ordinary skill in the art at the time of invention to upgrade Chapell, Matsuoka, with Hampel's movable dielectric slab of the feed network to control the phase shift, in order to vary the antenna radiation pattern formed by radiating elements.

Regarding **claim 94**, Hampel teaches a cellular telecommunications system comprising a phase array antenna [col. 5, lines 50-60].

Claims Objection

11. Claims 80, 81, 83, 91 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior arts fails to teaches the wherein the first and second signal conductor have opposed substantially planar coupling surfaces [claim 80]; & the wherein the first and second arms of the third signal conductor extend in substantially parallel directions [claim 83]; a power splitter/combiner comprising three or more signal terminals and a variable phase shifter coupled between two signal terminal [claim 91]. The dependent claim 81 is objected due to the dependency upon objected claim 80.

Allowable Subject Matter

12. The following is an examiner's statement of reasons for allowance:

Claims 95-103 are allowable over the prior art of record. The prior arts fail to teach singly, particularly, or in combination, the allowable features in claim 95, having

Art Unit: 2685

foreign priority 5/20/1999, for a method for **manufacturing a variable phase shifter**, the method comprising the steps of:

i) **arranging first and second coupled signal conductors** to provide a transmission path through the phase shifter, the signal conduction being relatively movable to vary the physical length of the transmission path; and

ii) **forming an oxide coating on a surface** of at least one of the signal conductors.

The dependent claims are also allowable due to their dependency upon the independent claims and the having additional claimed features.

The closest prior art **Chapell (US 4,755,778)** fails to teach the manufacturing method of a variable phase shifter, comprising the steps i) & ii).

Other prior arts in below has been considered, but they fail to teach the above allowable claim features.

Karabinis et al. (US 5,907,306) teaches the oxide coating for the contacting metal sleeve for adjusting the antenna electrical length [col. 7, lines 16-20; col. 4, lines 49-63], but fail to teach the above allowable manufacturing steps.

Other prior arts, **Barkman-'311, Caule-'922, Wheel-'359, Bennin-'075, Aktes-'777, Bingle-'067, Hampel-'462**, has shown the teachings in above of this office action, they fail to teach the above allowable manufacturing steps.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Art Unit: 2685

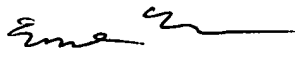
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Chow whose telephone number is (571) 272-7889. The examiner can normally be reached on 8:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles Chow *CC*,

February 8, 2006.


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